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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,958	12/04/2003	Shogo Kiyota	5332-8PCON	7410

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EXAMINER

DAHIMENE, MAHMOUD

ART UNIT PAPER NUMBER

1765

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/727,958

Applicant(s)

KIYOTA ET AL.

Examiner

Mahmoud Dahimene

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akatsu Masamichi et al. (JPO2001250678A) in view of Wada et al. (US 6,787,989).

Regarding claim 1, the reference of Akatsu discloses a transparent electrode plate for organic EL element wherein a metallic-oxide transparent electrode (conductive) layer on a thermoplastics transparent substrate (claim 3), and this thermoplastics

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substrate satisfies the requirement of a ten-point average of roughness R_z is 4 nm or less (page 2, paragraphs 0007-0008 of translation).

It is noted that Akatsu is silent about the smoothness (roughness) of the transparent electrode.

Wada describes an EL device using a transparent conductive film formed on a surface of the transparent substrate, wherein the transparent conductive film has a surface roughness of 1 to 10 (column 4, line 10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process Akatsu by controlling the surface roughness of the transparent conductive electrode film to be in the range of 1 to 10 nm which overlaps applicant claimed range of $0 \text{ nm} \leq R_z \leq 8 \text{ nm}$, because Wada teaches lower roughness is desirable. One of ordinary skill in the art would have been motivated to form a transparent electrode with low roughness because if the transparent conductive film as the anode has a large surface roughness, a high electric field can develop to the protruding portions of the surface. This causes a slight electric discharge to occur at the protruding portions, and therefore makes the device prone to a breakdown to form dark points from which light is no longer emitted, as suggested by Wada.

As to claim 2, the reference of Akatsu discloses It is desirable to use a melting extrusion method for obtaining the substrate surface smoothness (page 4, paragraph 0019) no polishing is mentioned.

Claim Rejections - 35 USC § 103

1. Claims 3, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akatsu Masamichi et al. (JPO2001250678A) in view of Wada et al. (US 6,787,989) as applied to claims 1 and 2 above, and further in view of Ikeda et al. (US 6,553,788).

Regarding claims 3 and 4, it is noted that the reference of Akatsu is silent about the surface of the transparent substrate is subjected to an acidic aqueous solution containing hydrofluoric acid or an alkaline aqueous solution containing potassium hydroxide or sodium hydroxide, and the surface of the transparent substrate is subjected to alkaline washing comprising using an alkaline liquid.

The reference of Ikeda teaches a method of manufacturing a transparent substrate where scrub-etching is used to smooth the surface of the substrate and forming a fine texture free of asperity in which the average surface roughness Ra is in a range between 0.4 and 3.0 nm and the ratio of the 10-point mean roughness (Rz) to the average surface roughness (Ra) is 14 or less. In example 4 (column 9, line 35) Ikeda cites "Then, the glass substrate was immersed in a 0.03 wt % aqueous hydrofluoric acid solution at 50.degree. C. for 30 minutes and rinsed with hot pure water to remove chemicals. Next cleaning in an aqueous potassium hydroxide solution was performed".

It is noted that Ikeda uses scrub-etching, however, Ikeda uses scrub-etching to bring the roughness from a higher value to a much lower value, then follows with immersion (without scrubbing) in hydrofluoric acid solution, and later in potassium hydroxide solution for cleaning.

Akatsu's substrate does not use any scrubbing or polishing to obtain the desired smoothness, however, it would appear that Akatsu's substrate could also benefit from the processing steps of Ikeda involving immersion (without scrubbing) in hydrofluoric acid solution and later cleaning in potassium hydroxide solution as described in example 4.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process Akatsu by adding the two processing steps of Ikeda as described above because Ikeda teaches the hydrofluoric acid immersion improves the smoothness (column 8, line 10) and the potassium hydroxide cleans the substrate. One of ordinary skill in the art would have been motivated to add the two steps of Ikeda in order to obtain a smoother and cleaner substrate which is desirable for further EL formation.

Claim Rejections - 35 USC § 103

2. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akatsu Masamichi et al. (JPO2001250678A) in view of Wada et al. (US 6,787,989) as applied to claims 1 and 2 above, and further in view of Ikeda et al. (US 6,553,788).

It is noted that Akatsu is silent about polishing.

Ikeda describes a method for manufacturing a magnetic disk from a transparent glass substrate using polishing or scrub-etching to obtain a smoothness Rz less or equal to 4 nm as defined by a surface roughness Ra in a range from 0.4 nm to 3 nm and a ratio of of a 10-point mean roughness Rz to the average surface roughness Ra of

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14 or less (meaning $R_z/R_a = 14$ or less) (see claim 1) which yields (after calculation) an R_z values of 5.6 nm or less (calculated when $R_a = 0.4$ nm and $R_z/R_a < 14$) which includes an R_z value of 4 nm or less.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process Akatsu and perform further post polishing treatments such as in example 3 (column 9, line 14) until a value of less than 4 nm is reached for R_z because Ikeda teaches values of less than (calculated) 5.6 nm for R_z are achievable, it appears that repeating the post polishing treatment of any substrate would yield further reduction of the roughness. One of ordinary skill in the art would have been motivated to perform further post polishing process steps, such as the ones in example 3 or example 4, in order to obtain a smoother surface on the substrate which is desirable for obtaining even lesser amount of asperity on the surface as suggested by Akatsu.

Claim Rejections - 35 USC § 103

3. Claims 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akatsu Masamichi et al. (JPO2001250678A) in view of Wada et al. (US 6,787,989) and Ikeda et al. (US 6,553,788) as applied to claim 5, and further in view of Ishibashi et al. (US 6,423,125) and Mitani et al (US 6,568,995).

It is noted that Akatsu is silent about polishing.

As discussed above Ikeda teaches, "Then, the glass substrate was immersed in a 0.03 wt % aqueous hydrofluoric acid solution at 50.degree. C. for 30 minutes and

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rinsed with hot pure water to remove chemicals. Next cleaning in an aqueous potassium hydroxide solution was performed”

It is noted that the method of Ikeda is silent about a cerium oxide powder for polishing the transparent substrate and sulfuric and ascorbic acids washing.

The reference of Ishibashi teaches cerium oxide powder with predetermined mean particle diameter is conventionally used for polishing to obtain very smooth surfaces (column 5, line 47), and sulfuric acid and ascorbic acids are also used in the method and they are conventionally used in the art (column 4, line 30).

The reference of Mitani teaches a method of cleaning glass substrate, where it was found from experimental results, that the washing solution containing nitric acid and ascorbic acid gave a higher dissolving rate of lanthanoid oxides than other combinations.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Akatsu by adding a polishing step using cerium oxide powder and a cleaning step using a nitric acid and ascorbic acid mixture as described in the methods of Ishibashi and Mitani respectively because those methods are conventionally used for polishing of transparent surfaces for obtaining smooth surfaces as needed in the fabrication of magnetic disks and because reducing contaminants is also desirable. One of ordinary skill in the art would have been motivated to modify the method of Akatsu in order to obtain a cleaner and even smoother surface which is desirable according to Akatsu.

Response to Arguments

4. Applicant's arguments, see pages 6-9, filed on 09/11/2006, with respect to the rejection(s) of claim(s) 1-2 under 35 USC § 102(b) have been fully considered and are persuasive in view of the new added limitation of controlling the transparent conductive surface smoothness as recited in claim 1. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Wada et al. (US 6,787,989).

Conclusion

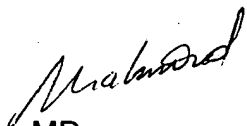
5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mahmoud Dahimene whose telephone number is (571) 272-2410. The examiner can normally be reached on week days from 8:00 AM. to 5:00 PM..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


MD.


LAN VINH
PRIMARY EXAMINER